Remarks

The Examiner's reconsideration of the application is requested in view of the amendments above and comments which follow.

Claim objections

The "narrative" language identified by the examiner under this heading has been deleted.

Claim rejections - 35 U.S.C. §102

Claim 67 and Claim 86

Claim 67 has been amended to emphasize that the "thicker downstream scintillation crystal" referred to is of a one-piece construction, as illustrated by way of example in Figure 1 of the application (item 12). This unitary construction of the downstream crystal is not disclosed or suggested by Neale et al (US 5524133).

The arrangement disclosed in Neale relied on by the examiner includes a downstream sandwich consisting of thin crystals and high-Z converters. There is no suggestion that the downstream crystals could be thicker than the first, relatively thin crystal, and in the associated Figure 15, the downstream crystals are shown as thinner than the first crystal 172.

The same comments apply to claim 86.

Claim 102 (now claim 107)

The features of claims 102 and 103 have been incorporated into claim 107.

Claim 107 now defines a calibration method for a material discrimination system including a linac which involves moving a step wedge across the X-ray beam and determining the average signal value versus step thickness.

With regard to old claim 107, the examiner relied on a combination of Neale with Newman et al (US 5420441). Newman describes the use of a lead mask test target secured to a storage phosphor and exposed using a standard medical X-ray source. The exposed storage phosphor is then read by a storage phosphor reader to produce a digital X-ray image and then the image is analysed to calibrate the reader. Thus the step wedge locations of the test target are exposed simultaneously.

In the method of claim 107, a step wedge is moved across the X-ray beam, which is therefore a quite different approach to that adopted by Newman. It generates an average signal for each step, giving a greater signal-to-noise ratio than exposing all steps simultaneously.

Claim 111

Claim 111 has been amended to specify that the high energy X-rays referred to have energies greater that 1MeV, and the lower energy X-rays have energies of approximately 100keV. Neale discloses a detection method using high energy X-rays, defined therein as in excess of 1MeV only. There is no reference to a testing method involving inspection using firstly X-rays of energy greater than 1MeV and then rays around 100keV, and using the results to determine the identity of constituents in the object under test. Use of such an approach is described in the PCT specification in the paragraph spanning pages 9 and 10 and reference to low energies around 100keV is made in the third paragraph on page 3.

Claim 93

The features of this claim are rejected as anticipated by Bjorkholm (US 4511799). The claim has been amended to further distinguish its content from this citation by specifying that the front and rear scintillation crystals are separate crystals having a low-Z converter therebetween.

In Bjorkholm, two serially arranged detectors are provided by a single scintillation crystal. There is no suggestion of an arrangement in which two spaced apart crystals are cut from the same ingot in order to provide matched performance, whilst including a low-Z converter between them to reduce the back-scatter of electrons into the front crystal and to prevent electrons which have left the front crystal from returning thereto.

Claim rejections - 35 U.S.C. §103

Claim 83

Claim 83 has been rejected as being unpatentable in view of Neale together with DiFilippo (US 6078052).

The examiner refers to the bundle of fibers 14 shown in Figure 2 of DiFilippo, which are laid side by side over one face of a crystal 12. It is noted that the outputs from the fibers at opposite ends of the bundle 14 are added together.

Claim 83 has been amended to emphasize the difference between the arrangement disclosed in the present application and that of DiFilippo, namely that signals from opposite side faces of a detection crystal are added together as shown in the Figures. This feature is not present in DiFilippo. Addition of signals from opposite side faces avoids any left/right asymmetry in an output signal and this benefit would not be achieved by the arrangement of DiFilippo.

Claim 97

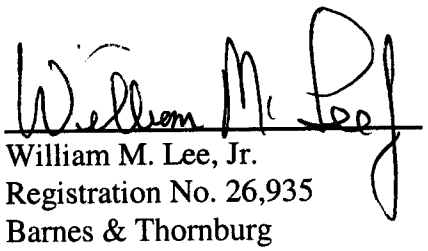
Claim 97 has been amended to incorporate the features of claim 98. Claim 97 was objected to on the basis of Grodzins (US 6151381) in combination with Rivard (US 2003/0204126). Rivard describes calibration of a GM counter in connection with radiation therapy to treat diseases using ionising radiation.

In contrast, claim 97 is concerned with a material discrimination system including a linac. It addresses a problem of noise generation specifically concerned with the use of a linac, namely interference caused by the electron generation process itself in the linac. This problem is addressed by carrying out a read-out cycle for each linac pulse, but triggering the linac on each alternate pulse only. Signals generated for pulses on which the linac is not triggered provide a measure of background, noise and crystal persistence. This is not suggested by a combination of Grodzins and Rivard.

Therefore, it is submitted that the claims, as amended, distinguish from the prior art and are allowable thereover. The Examiner's further and favorable reconsideration in that regard is urged. As this response is being filed during the fourth month following the Examiner's Office Action, an appropriate Petition for Extension of Time is also submitted herewith.

December 5, 2006

Respectfully submitted,



William M. Lee, Jr.
Registration No. 26,935
Barnes & Thornburg
P.O. Box 2786
Chicago, Illinois 60690-2786
(312) 214-4800
(312) 759-5646 (fax)